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Conjugated Polymer Organic Solar Cells made using Low Bandgap Vinylene-linked Benzothiadiazole-thiophene N. C. HESTON, Univ of Florida, J. MEI, S. VASILYEVA, J. R. REYNOLDS, Univ. of Florida — With over 70% of the solar photon flux occurring at wavelengths beyond 700 nm, the broad absorption spectra of low bandgap conjugated polymers offers an additional path towards improving organic photovoltaic efficiencies. Here, we report on polymer solar cells fabricated using a vinylene-linked benzothiadiazole-thiophene polymer and [6,6]-phenyl-C_{61}-butyric acid methyl ester (PCBM) blends. We have fabricated cells with various blend film polymer to PCBM ratios as well as film thicknesses and architectures. The performance of these cells was investigated using both AM 1.5 and incident photon to current efficiency measurements. Surface morphologies were characterized using atomic force microscopy. A strong correlation was observed between the percentage of polymer in the blend and the resulting film morphology. We observed photon-generated currents at wavelengths greater than 800nm, though we have not yet obtained high overall power conversion efficiencies.

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